Silicon Carbide (SiC) Schottky Diode – EliteSiC, 8 A, 1200 V, D1, DPAK

**FFSD08120A**

**Description**
Silicon Carbide (SiC) Schottky Diodes use a completely new technology that provides superior switching performance and higher reliability compared to Silicon. No reverse recovery current, temperature independent switching characteristics, and excellent thermal performance sets Silicon Carbide as the next generation of power semiconductor. System benefits include highest efficiency, faster operating frequency, increased power density, reduced EMI, and reduced system size and cost.

**Features**
- Max Junction Temperature 175°C
- Avalanche Rated 80 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery/No Forward Recovery
- This Device is Pb−Free, Halogen Free/BFR Free and RoHS Compliant

**Applications**
- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

**MARKING DIAGRAM**

A = Assembly Plant Code
YWW = Date Code (Year & Week)
ZZ = Lot Code
FFSD08120A = Specific Device Code

**ORDERING INFORMATION**
See detailed ordering and shipping information on page 2 of this data sheet.
## ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{RRM}</td>
<td>Peak Repetitive Reverse Voltage</td>
<td>1200</td>
<td>V</td>
</tr>
<tr>
<td>E_{AS}</td>
<td>Single Pulse Avalanche Energy (Note 1)</td>
<td>80</td>
<td>mJ</td>
</tr>
<tr>
<td>I_F</td>
<td>Continuous Rectified Forward Current @ T_C &lt; 168°C</td>
<td>8</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Continuous Rectified Forward Current @ T_C &lt; 135°C</td>
<td>22.5</td>
<td>A</td>
</tr>
<tr>
<td>I_{F,Max}</td>
<td>Non-Repetitive Peak Forward Surge Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>T_C = 25°C, 10 μs</td>
<td>530</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>T_C = 150°C, 10 μs</td>
<td>480</td>
<td>A</td>
</tr>
<tr>
<td>I_{F,SM}</td>
<td>Non-Repetitive Forward Surge Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Half-Sine Pulse, t_p = 8.3 ms</td>
<td>77</td>
<td>A</td>
</tr>
<tr>
<td>I_{F,RM}</td>
<td>Repetitive Forward Surge Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Half-Sine Pulse, t_p = 8.3 ms</td>
<td>45</td>
<td>A</td>
</tr>
<tr>
<td>P_{TOT}</td>
<td>Power Dissipation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>T_C = 25°C</td>
<td>263</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>T_C = 150°C</td>
<td>44</td>
<td>W</td>
</tr>
<tr>
<td>T_{J, STG}</td>
<td>Operating and Storage Temperature Range</td>
<td>−55 to +175</td>
<td>°C</td>
</tr>
</tbody>
</table>

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. E_{AS} of 80 mJ is based on starting T_J = 25°C, L = 0.5 mH, I_{AS} = 18 A, V = 50 V.

## THERMAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>R_{JUC}</td>
<td>Thermal Resistance, Junction to Case, Max</td>
<td>0.57</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

## ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Condition</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_F</td>
<td>Forward Voltage</td>
<td>I_F = 8 A, T_C = 25°C</td>
<td>−</td>
<td>1.45</td>
<td>1.75</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_F = 8 A, T_C = 125°C</td>
<td>−</td>
<td>1.7</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_F = 8 A, T_C = 175°C</td>
<td>−</td>
<td>2.0</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>I_R</td>
<td>Reverse Current</td>
<td>V_R = 1200 V, T_C = 25°C</td>
<td>−</td>
<td>−</td>
<td>200</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_R = 1200 V, T_C = 125°C</td>
<td>−</td>
<td>−</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_R = 1200 V, T_C = 175°C</td>
<td>−</td>
<td>−</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Q_C</td>
<td>Total Capacitive Charge</td>
<td>V = 800 V</td>
<td>−</td>
<td>55</td>
<td>−</td>
<td>nC</td>
</tr>
<tr>
<td>C</td>
<td>Total Capacitance</td>
<td>V_R = 1 V, f = 100 kHz</td>
<td>−</td>
<td>538</td>
<td>−</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_R = 400 V, f = 100 kHz</td>
<td>−</td>
<td>50</td>
<td>−</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_R = 800 V, f = 100 kHz</td>
<td>−</td>
<td>40</td>
<td>−</td>
<td></td>
</tr>
</tbody>
</table>

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Top Marking</th>
<th>Package</th>
<th>Packing Method</th>
<th>Reel Size</th>
<th>Tape Width</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFSD08120A</td>
<td>FFSD08120A</td>
<td>DPAK</td>
<td>Tape &amp; Reel†</td>
<td>13&quot;</td>
<td>12 mm</td>
<td>2500 Units</td>
</tr>
</tbody>
</table>

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D

www.onsemi.com
TYPICAL CHARACTERISTICS
(TJ = 25°C UNLESS OTHERWISE NOTED)

Figure 1. Forward Characteristics

Figure 2. Reverse Characteristics

Figure 3. Reverse Characteristics

Figure 4. Current Derating

Figure 5. Power Derating

Figure 6. Capacitive Charge vs. Reverse Voltage
TYPICAL CHARACTERISTICS (CONTINUED)

(TJ = 25°C UNLESS OTHERWISE NOTED)

DUTY CIRCLE

− DESCENDING ORDER

SINGLE PULSE

0.01
0.02
0.05
0.1
0.2
0.5

Figure 7. Capacitance vs. Reverse Voltage

Figure 8. Capacitance Stored Energy

Figure 9. Junction−to−Case Transient Thermal Response Curve

TEST CIRCUIT AND WAVEFORMS

L = 0.5 mH
R < 0.1 Ω
VDD = 50 V
EAVL = 1/2LI2 [VR(AVL) / (VR(AVL) − VDD)]
Q1 = IGBT (BVCES > DUT VR(AVL))

Figure 10. Unclamped Inductive Switching Test Circuit & Waveform
DPAK3 6.10x6.54x2.29, 4.57P
CASE 369AS
ISSUE B

DATE 20 DEC 2023

NOTES: UNLESS OTHERWISE SPECIFIED
A) THIS PACKAGE CONFORMS TO JEDEC, TO-252,
ISSUE F, VARIATION AA.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER
D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED
CORNERS OF EDGE PROTRUSION.
E) FOR IODE PRODUCTS, L4 IS 0.25 MM MAX PLASTIC BODY
STUB WITHOUT CENTER LEAD.
F) DIMENSIONS ARE EXCLUSIVE OF BURRS,
MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD
TO028P200X2039-3N.

GENERIC MARKING DIAGRAM*

**This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "C", may
or may not be present. Some products may not follow the Generic Marking.**

XXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Assembly Lot Code

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

DOCUMENT NUMBER: 98AON13810G
DESCRIPTION: DPAK3 6.10x6.54x2.29, 4.57P

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